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| APPLICATION NO.   | FILING DATE        | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.  | CONFIRMATION NO. |                   |                            |            |            |
|---|--------------------|----------------------|--|------------------|-------------------|----------------------------|------------|------------|
| 10/646,226  | 08/22/2003         | Izaya Okae           | 112857-424   | 1391             |                   |                            |            |            |
| 29175<br>K&L Gates LLP<br>P. O. BOX 1135<br>CHICAGO, IL 60690 | 7590<br>02/26/2010 |                      | <table border="1"><tr><td>EXAMINER</td></tr><tr><td>ECHELMEYER, ALIX ELIZABETH</td></tr></table>                                   |                  | EXAMINER          | ECHELMEYER, ALIX ELIZABETH |            |            |
| EXAMINER  |                    |                      |  |                  |                   |                            |            |            |
| ECHELMEYER, ALIX ELIZABETH                                    |                    |                      |  |                  |                   |                            |            |            |
|   |                    |                      | <table border="1"><tr><td>ART UNIT</td><td>PAPER NUMBER</td></tr><tr><td>1795</td><td></td></tr></table>                           |                  | ART UNIT          | PAPER NUMBER               | 1795       |            |
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|   |                    |                      | <table border="1"><tr><td>NOTIFICATION DATE</td><td>DELIVERY MODE</td></tr><tr><td>02/26/2010</td><td>ELECTRONIC</td></tr></table> |                  | NOTIFICATION DATE | DELIVERY MODE              | 02/26/2010 | ELECTRONIC |
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| 02/26/2010  | ELECTRONIC         |                      |  |                  |                   |                            |            |            |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

# Office Action Summary

## Application No.

10/646,226

## Applicant(s)

OKAE ET AL.

## Examiner

Alix Elizabeth Echelmeyer

## Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 6-10, 12-14 and 16-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-10, 12-14 and 16-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. This Office Action is in response to the amendment filed November 30, 2009. Claim 16 is amended. Claims 6-10, 12-14, and 16-23 are pending and are rejected finally for the reasons given below.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaura (JP 2002-075368) in view of Abe (US 6,258,483) and as evidenced by Chaloner-Gill et al. (US 2002/0192137).

Yamaura teaches a positive electrode active material for a nonaqueous electrolyte cell wherein the particles of active material are of the formula  $\text{LiNi}_{1-x}\text{M}_x\text{O}_2$  wherein M is one of Al, Co, and B, and the surfaces of the particles are covered by particles of the general formula  $\text{LiFePO}_4$  (abstract, [0001]).

In paragraph [0037] of the instant disclosure, applicants name  $\text{LiFePO}_4$  as a preferable positive active material but fail to state explicitly that  $\text{LiFePO}_4$  is of the olivine structure.

Chaloner-Gill teaches that crystalline lithium iron phosphate has an olivine structure ([0126]).

Yamaura fail to teach the claimed weight percent of  $\text{LiFeO}_4$  to lithium nickelate substrate.

Abe teaches a battery having a positive active material having one material coated on another (column 6 lines 2-5). Abe further teaches that the right amount of coating should be determined, since if there is too much or too little the active material will not have the desired properties of both materials (column 13 lines 38-48).

One of ordinary skill in the art could have applied the improvement of Abe of determining the best ratio coating to base particle to the ratio of nickelate to  $\text{LiFeO}_4$  in Yamaura and the results would have been predictable.

4. Claims 6-9, 12, 13, and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaura in view of Abe and Kurose et al. (WO00/02280, with US6,824,924 used as an English translation, since it is the 371 of the foreign application) and as evidenced by Chaloner-Gill et al.

As for claims 6, 12, 16 and 19, Yamaura teaches a positive electrode active material for a nonaqueous electrolyte cell wherein the particles of active material are of the formula  $\text{LiNi}_{1-x}\text{M}_x\text{O}_2$  and the surfaces of the particles are covered by particles of the general formula  $\text{LiFePO}_4$  (abstract, [0001]).

In paragraph [0037] of the instant disclosure, applicants name  $\text{LiFePO}_4$  as a preferable positive active material but fail to state explicitly that  $\text{LiFePO}_4$  is of the olivine structure.

Chaloner-Gill teaches that crystalline lithium iron phosphate has an olivine structure ([0126]).

Regarding claims 7, 8, 17, 18, 20 and 21, the  $\text{LiNi}_{1-x}\text{M}_x\text{O}_2$  particles are  $11.458 \mu\text{m}$  on average and the  $\text{LiFePO}_4$  particles are  $0.185 \mu\text{m}$  on average ([0054]).

With further regard to claims 6, 12, 16 and 19, Yamaura fail to teach the claimed weight percent of  $\text{LiFeO}_4$  to lithium nickelate substrate.

Abe teaches a battery having a positive active material having one material coated on another (column 6 lines 2-5). Abe further teaches that the right amount of coating should be determined, since if there is too much or too little the active material will not have the desired properties of both materials (column 13 lines 38-48).

One of ordinary skill in the art could have applied the improvement of Abe of determining the best ratio coating to base particle to the ratio of nickelate to  $\text{LiFeO}_4$  in Yamaura and the results would have been predictable.

With further regard to claims 8, 18 and 21, when the desired ratio of  $\text{LiFePO}_4$  particles to nickelate is determined as discussed above, the claimed coating thickness would result since the thickness is determined by the amount of coating material.

Yamaura fails to teach the lithium nickelate compound of instant claims 6, 9, 12, 13, 16 and 19.

Kurose et al. teach  $\text{LiNiO}_2$  as a positive electrode active material (column 2 lines 56-58). Kurose et al. further teach that the use of  $\text{LiNiO}_2$  as a positive electrode active material leads to a reduction in size and weight in the battery, increasing energy density.

It would be desirable to use  $\text{LiNiO}_2$  as a positive electrode active material in the battery of Yamaura such as taught by Kurose et al. since it would lead to a reduction in size and weight in the battery, increasing energy density.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to look to the teachings of Kurose et al. suggesting the use of  $\text{LiNiO}_2$  as a positive electrode active material in the battery of Yamaura, since such a substitution of  $\text{LiNiO}_2$  for the lithium nickel oxide of Yamaura would result in the reduction of size and weight of the battery, leading to an increase in energy density.

5. Claims 10 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaura et al. in view of Kurose et al. as applied to claims 6 and 12 above, and further in view of Goodenough et al. (US 6,391,493).

Yamaura et al. in view of Kurose et al. fail to teach that the olivine compound of the positive active material is  $\text{LiMnPO}_4$ .

Goodenough et al. teach that that a preferred olivine electrode compound is  $\text{LiMnPO}_4$  (column 2 lines 22-24), since it has a larger free volume for lithium-ion motion,

which leads to higher lithium-ion conductivity and higher power density, as well as making an inexpensive and nonpolluting battery (column 1 lines 51-57).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to look to the teachings of Goodenough et al. suggesting the use of  $\text{LiMnPO}_4$  as a positive electrode active material in the battery of Yamaura in view of Kurose et al., since such a substitution of  $\text{LiMnPO}_4$  for the  $\text{LiFePO}_4$  of Yamaura is obvious over the teachings of Goodenough et al.

### ***Response to Arguments***

6. Applicant's arguments filed November 30, 2009 have been fully considered but they are not persuasive.

First, Applicant argues that Abe fails to teach determining the desired amount of coating. The examiner inadvertently left out the citation for this teaching. It is found in Abe at column 13 lines 38-48. The examiner apologizes for the typographical error.

Next, Applicant argues that the teachings of Abe are concerned with different material than those of Yamaura et al. While this is true, Abe teaches the use of solid electrode particles of two different formulae, with one material coated by the other, as discussed above. The skilled artisan, based on Abe's teaching of improving the electrode by determining the right amount of coating, would be motivated to determine the right balance of coating to base material in Yamaura et al. It has been found that the use of a known technique to improve similar devices is obvious to the skilled artisan.

MPEP 2141 III.

As for Applicant's arguments to the combinability of Yamaura et al. and Abe, the examiner is not convinced. According to Applicant, the references cannot be combined because Abe is concerned with amorphous materials and Yamaura et al. is concerned with crystalline materials. Regardless of the state of the active materials, the teachings of Abe that are relied upon are those concerning the combination of the coating material and base material. Surely, the skilled artisan would not disregard Abe simply because the state of the materials is not the same. Additionally, Abe teach that the materials may be in any state from amorphous to crystalline (abstract).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/  
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